Developmental Effects of Prospective Memory Monitoring and After-Effects of Responding to Prospective Memory Targets

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Prospective memory is the ability to form an intention, retain it in memory, and retrieve it at the appropriate occasion. This ability is essential for goal achievement and develops markedly during childhood. Embedding a prospective memory task in an ongoing task comes at **cost** to the ongoing task performance. This cost is typically characterized by a slowing down and is thought to have two sources: **Strategic monitoring** for prospective memory target events and **after-effects** of responding to the targets.

Aims of the present study:

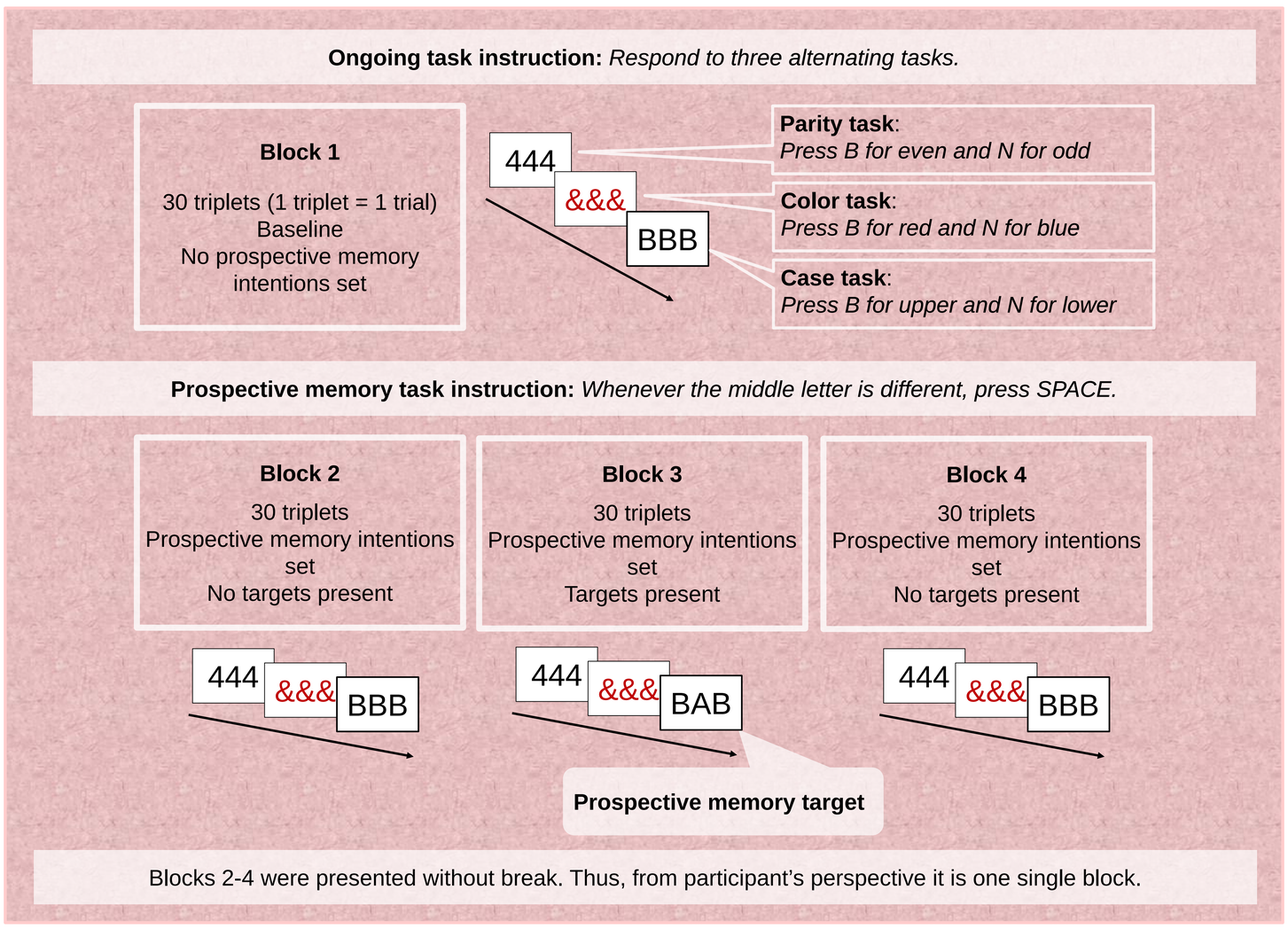
a) Disentangle slowing produced by strategic monitoring for prospective memory targets vs. responding to prospective memory targets.

b) Investigate the developmental trajectory of the processes involved in monitoring and the after-effects of responding to targets.

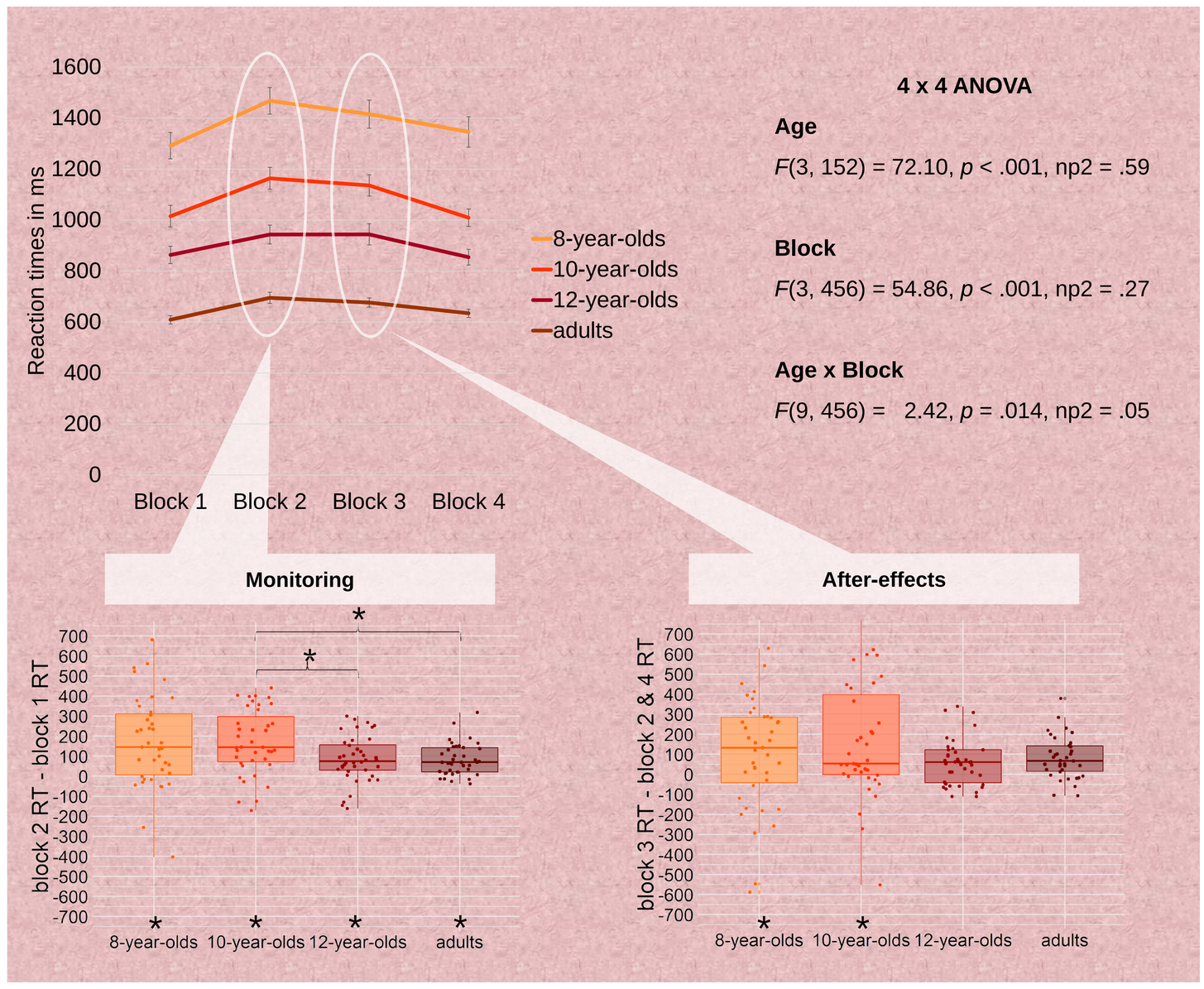
To this end, three groups of children and young adults performed three alternating tasks (ongoing task) in four blocks. In block 1, participants performed the ongoing task without prospective memory instructions. In block 2, participants were instructed for the prospective memory task but no target events occurred before block 3. To control for practice effects we included a fourth block again without targets. Because block 1 and block 2 differed only in the intention setting, longer reaction times in block 2 reflect the cost of strategic monitoring. After-effects, on the other hand, were examined in block 3 on the first trial after responding to a target by comparing the reaction times to the mean of the corresponding trials of block 2 and 4.

Age group	M_{age}	age range	n	Prospective memory performance
8-year-olds	8.4	7.7 – 8.9	39	97%
10-year-olds	10.1	9.5 – 10.9	39	95%
12-year-olds	12.1	11.7 – 12.9	40	95%
adults	23.0	19.5 – 32.9	38	96%

Method



Results



Summary and Conclusion

(1) Although no targets appeared in block 2, participants performed the ongoing task more slowly than in block 1 due to **strategic monitoring**. Already 8-year-old children are able to monitor for prospective memory targets enabling a high prospective memory performance comparable to adult's level. From age 10 monitoring costs decrease markedly.

(2) Compared to blocks 2 and 4, there was an immediate slowing after responding to prospective memory targets in block 3 representing **after-effects**. This effect was only significant in the groups of 8- and 10-year-olds. However, no age effect emerged.

(3) The processes underlying strategic monitoring and after-effects in prospective memory **differ in their developmental trajectory**.